# The Relationship Insurance Role of Financial Conglomerates:

# Evidence from Earnings Announcements

Jiun-Lin Chen, Gary C. Sanger and Wei-Ling Song*

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**Abstract**

Financial conglomerates have the opportunity to gather information from multiple sources, and to use that information in multiple ways. This paper uses earnings announcements to analyze the trading behavior and associated price impacts of relationship institutions, which have a lending or underwriting relationship with client firms and also hold client firms' equities through their asset management divisions. We find that buying support from relationship institutions surrounding client firms' negative earnings surprises mitigates both the negative initial impact on client firms' stock prices and longer term post-announcement drift. The magnitude of these effects is economically important. Support by relationship institutions is also associated with less selling by other, independent institutions holding the same client firms' shares. Further, price reactions to negative earnings surprises of unconnected firms (without any relationship institutions) are significantly larger. Our findings suggest that price support from relationship institutions helps resolve the uncertainty accompanying clients' temporary earnings shocks, which can be considered welfare enhancing due to reduced noise in capital markets.

JEL Classification: G12, G14, G21, G24

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* Jiun-Lin Chen (alex.chen@adelaide.edu.au) is at the University of Adelaide; Gary C. Sanger (sanger@lsu.edu) is at the E.J. Ourso College of Business, Louisiana State University, and Wei-Ling Song (wsong@lsu.edu) is at the E.J. Ourso College of Business, Louisiana State University.

## 1. Introduction

Institutional investors play important roles in financial markets and their actions may have diverse effects on both firms and market prices. For example, Chen, Harford, and Li (2007) document the monitoring role of institutional investors, while Cella, Ellul, and Giannetti (2013) provide evidence of price pressure by short-term institutional investors during times of market turmoil. Allen, Morris, and Shin (2006) demonstrate theoretically that stock price can deviate from its liquidation value when traders are motivated to second- and third-guess other traders in order to profit from short-run price movements. In their model, even long-lived traders with a preference for smoothing consumption over time will care about short-run price movements. It follows that firms may have a desire to maintain smooth stock prices.

In light of the above discussions, this paper proposes a price support role for a special type of institutional investor which we term a "relationship institution". This is defined as an institutional investor which has a lending or underwriting relationship with a client firm and also holds the clients' equities through its asset management divisions. We hypothesize that, given the fees or interest payments collected from client firms, relationship institutions may have the incentive to support clients' stock prices, especially in the short run. Relationship institutions, as long term business partners, can strengthen their relationships with client firms by purchasing clients' stocks especially during periods of selling pressure by other types of institutions.

The prevalence of this type of relationship has increased dramatically due to regulatory change. The gradual relaxation of the Glass-Steagall Act, culminating with passage of the Gramm-Leach-Bliley Act in 1999 has resulted in complex relations among diverse financial

institutions (Lown, Osler, Strahan, and Sufi, 2000).[1] These relations and their consequences for the functioning of capital markets have also attracted wide attention by researchers. It is not uncommon for a financial conglomerate to both aid firms in fund raising (either lending, IPO or SEO equity financing) and to invest in the same firms' equity through one or more of its asset management subsidiaries. These financial institutions have economies in acquiring and producing information on their client firms as a byproduct of their lending/underwriting relationships. By exploiting economies of scale and scope, financial institutions can accumulate private information about their clients and share this information firm-wide. For example, Acharya and Johnson (2007) show evidence of the use of private information by informed banks in the credit default swap market. Massa and Rehman (2008) find that the mutual funds affiliated with banks increase their portfolio weights in the firms borrowing from these banks, enhancing fund performance by an average of 1.4% per year. Connections among subsidiaries also create complex sets of incentives that can reasonably be expected to affect behaviors.

To test the potential for relationship institutions to support client firms' stock prices, we examine the trading behavior and resulting price impacts of relationship institutions surrounding earnings announcements. Earnings surprises offer a convenient opportunity to examine institutional trading behavior surrounding the public release of client firm information. The regular frequency of earnings announcements facilitates our analysis by providing a large sample over a wide variety of business conditions. Our setting helps to avoid the selection bias issue that may be involved in irregular corporate events such as capital raising or mergers. It also captures

[1] The repeal process started in 1987. Banks were required to submit individual applications to establish Section 20 Subsidiaries. For more details, see J.P Morgan & Co. Inc., The Chase Manhattan Corp., Bankers Trust New York Corp., Citicorp, and Security Pacific Corp., Federal Reserve Bulletin 75 (1989): 192-217. See also Federal Register 61 (1996), pages 68750-68756 for subsequent relaxation of the rules.

the long-term nature of relationships between client firms and institutions more clearly than infrequent corporate events. Furthermore, earnings announcements are associated with various market anomalies. We believe the findings in this paper help to shed light on these anomalies.

To test our hypotheses, we analyze the stock trading patterns of two different types of financial institutions: relationship institutions and independent institutions. We define relationship institutions as those that hold shares of firms that they have also served as either lenders or underwriters within a three-year period prior to these client firms' earnings announcements. Other (non-connected) institutions holding these same firms shares are classified as independent institutions.

Following the literature discussed above, we formally analyze institutional trading and related stock price impacts by contrasting two hypotheses: the relationship insurance hypothesis and the information advantage hypothesis. The relationship insurance hypothesis predicts that relationship institutions will tend to support their clients' stock prices by increasing holdings of clients' shares surrounding short-term negative earnings shocks. If such price support activities are effective, firms having relationship institutions should have smaller price reactions to negative earnings surprises than firms without support. On the contrary, the information advantage hypothesis suggests that relationship institutions will exploit the private information obtained from their affiliated banks to improve their performance. In this case, relationship institutions will reduce their holdings before their client firms announce negative earnings surprises.

Our findings are consistent with relationship insurance hypothesis. We find that relationship institutions increase their holdings of clients' shares while independent institutions reduce their holdings surrounding negative surprises. We also contrast the holding patterns of

independent institutions across two classifications of firms – those with relationship institutions (connected firms) versus those without relationship institutions (unconnected firms). Interestingly, we observe that independent institutions more aggressively reduce their holdings of unconnected firms (by nearly four times) relative to those of connected firms. These findings suggest that relationship institutions, on average, support their clients when negative earnings surprises occur, possibly signaling the unobserved strength of client firms to the market. These activities by relationship institutions also appear to discourage the selling of connected firms by independent institutions. The behavior of independent institutions is consistent with the fact that both the announcement effect and post-earnings-announcement drift are lower for connected firms, thus presenting a less profitable trading strategy relative to unconnected firms.

To examine the effects of institutional trading more closely, we construct a price support (PS) measure (described in Section 4.4) designed to capture both the magnitude of buying or selling activity and the sign and magnitude of earnings surprises. We calculate this PS measure for relationship institutions and independent institutions and examine whether price impacts differ when connected firms are traded by relationship versus independent firms.

First, we find that relationship institutions provide more price support for client firms' stocks than independent institutions when the firms experience negative earnings shocks. Interestingly, price support of these client firms by independent institutions, albeit smaller in magnitude, suggests that the presence of relationship institutions appears to encourage independent institutions to buy shares. Second, independent institutions do not support unconnected firms, and in fact strongly sell when measured by PS. This is consistent with the finding that the earnings surprise and momentum effects are stronger among unconnected firms.

To further examine the effects of trading by relationship and independent institutions, we analyze hedge portfolio (buy-minus-sell) returns by sorting on our PS measure for firms with negative average earnings surprises. Specifically, we hold the extreme-buy quintile portfolio and short the extreme sell quintile portfolio. Interesting patterns emerge. For independent institutions, hedge portfolio returns are significantly positive prior to the current earnings announcement and significantly negative for the following 15 months. This clear reversal of hedge portfolio returns suggests that trading by independent institutions is not driven by fundamental information but instead is based on short-lived price movements.

By contrast, hedge portfolio returns based on relationship institutions' PS measures are largely insignificant both before and after negative earnings surprises. Surprisingly, client firms that are sold by their relationship institutions perform significantly better than those that are purchased. One possible interpretation is that relationship institutions raise capital by selling client firms that can do well on their own in the near future, and purchase clients' stocks in need of price support. The results are consistent with the relationship insurance hypothesis, and contrary to the information advantage hypothesis. Our findings are consistent with Griffin, Shu, and Topaloglu (2012) who find no evidence that relationship institutions trade on inside information for short-term profits.

Our paper demonstrates the association of independent institutions' trading with momentum and reversal, which are considered the most prominent anomalies in the financial markets as suggested by Vayanos and Woolley (2013). They build a theoretical model based on a negative shock to asset value that triggers fund outflows and further selling by the fund manager resulting in a temporary negative deviation of asset price from fundamental value. Similarly, we

show that the trading of independent institutions appears to push stock prices below their fundamental values when firms experience temporary negative earnings shocks.

We further document that the presence of relationship institutions seems to mitigate the impact of selling pressure by independent institutions. We contribute to the literature on financial institutions by providing evidence of a relationship insurance role in capital markets for a broad sample of firms using regular and frequent earnings announcements as the conditioning event. These findings may also have more general implications for the asset pricing literature. Support by relationship institutions appears to alter the stock return profile around negative earnings surprises by smoothing out temporary negative return shocks. Firms without such support experience wider temporary price swings. If relationships among institutions can reduce unnecessary price movements and discourage short-term trading, less noise in financial markets could be considered welfare enhancing.

The remainder of this paper is organized as follows. Section 2 develops our hypotheses. Section 3 describes the data and research design. Section 4 reports the empirical results for abnormal stock returns at the earnings announcement, subsequent earnings momentum, institutional trading behavior and price support. Section 5 concludes.

## 2. Hypothesis Development

### 2.1 The Roles and Incentives of Financial Conglomerates

Numerous studies explore various aspects of connections within financial conglomerates and with their client firms. Ellis, Michaely and O'Hara (2000) examine the price support activities of IPO underwriters and find that market markers within a financial group tend to support the stock prices of IPO firms underwritten by investment banks within the same group. Hao and Yan (2012) find that investment bank-affiliated mutual funds underperform unaffiliated

funds because they hold relatively large amounts of clients' underperforming IPO and SEO shares. Potential banking fees collected from client firms provide incentives for financial firms to support the stock prices of their clients to help maintain their banking relationships.

Chan, Karceski and Lakonishok (2007) claim analysts may issue favorable investment opinions to curry favor with executives who can direct future investment banking business to the analyst's firm. Yasuda (2005) also shows that lending relationships have a significant and positive effect on a firm's underwriter choice, particularly for junk-bond issuers and first-time issuers. Reuter (2006) documents a robust positive correlation between the annual brokerage payments that mutual fund families make to lead underwriters and the IPO allocations to these families. Ferreira and Matos (2012) also report that strong bank-firm relations (board seats, direct equity stakes or through institutional holdings) increase a bank's probability of being picked as lead syndicate arranger. The above stream of literature highlights the quid-pro-quo that seems to exist among financial firms and their subsidiaries.

Although regulators and market participants have expressed concern about the information spillover within financial conglomerates and have required them to erect "Chinese Walls" to prevent abuses, evidence from prior studies suggests that Chinese Walls may not be totally effective. This second strand of literature focuses on the informational advantages of combined business lines. Through underwriting or lending, banks have an advantage in acquiring private information about clients. Ivashina and Sun (2011) find that institutions participating in loan renegotiations subsequently trade the same firms' stocks and outperform a comparison group by 5.4% per year. Chen and Martin (2011) also suggest an information spillover from the commercial lending division to the equity research division in financial conglomerates. For those

clients with a lending association, bank affiliated analysts exhibit greater EPS forecast accuracy compared with independent analysts.

Dass and Massa (2011) argue that a strong bank-firm relationship has offsetting effects. Firms benefit through better corporate governance, but suffer reduced liquidity due to higher adverse selection perceived by other non-connected institutional shareholders. However, the findings of Dass and Massa (2011) are consistent with our proposition that relationship institutions can support clients' stock prices. Such an action may discourage short-term trading. Our paper thus adds to the above literature by providing evidence on the role of financial conglomerates as supportive institutional investors.

2.2 Institutional Investors and Earnings Surprises

Institutional investors are important financial intermediaries that manage money on behalf of individual investors. There are vest literature on their behaviors, roles, and impacts in the financial markets. Besides the special incentives of relationship institutions, investing for monetary gain is ultimately the primary goal of institutional investors. However, their strategies and information sources vary.

One strand of literature has focused on investment horizon, i.e., short-term investors versus long-term investors. Yan and Zhang (2009) find that only short-term investors are momentum traders and that stocks experiencing the largest increase in short-term institutional holdings have significantly higher earnings surprises and earnings announcement abnormal returns over the subsequent four quarters than stocks experiencing the largest decrease in short-term institutional holdings. Such patterns do not exist among the findings of long-term institutional holdings. They conclude that short-term institutions possess more information than long-term institutions.

In contrast to Yan and Zhang (2009), we focus on relationship institutions and independent institutions. Relationship institutions are definitely long term investors and their investment horizons are specific to the client firms rather than a general churn rate or portfolio turnover rate used to classify institutional investors by several studies, such as Yan and Zhang (2009) and Cella, Ellul, and Giannetti (2013). Literature also suggests that relationship institutions are informed. If their trades are not driven by short-term profit taking due to temporary earnings shocks, then the trading analysis will be inappropriate to infer whether relationship institutions have more information. In fact, using mergers and acquisitions as events, Chen, Harford, and Li (2007) show that long-term independent institutions only trade when there are very bad outcomes.

Other studies using earnings announcements to examine institutional trading include Baker, Litov, Wachter, and Wurgler (2010) and Jiang and Zheng (2014). Baker et al. (2010) also find evidence that aggregate mutual fund trades forecast earnings surprises. However, the predictability reduced following the passage of SEC Regulation Fair Disclosure, which since October 2000 has banned the selective disclosure of corporate information to a preferred set of investors. Our study, on the other hand, offers another possible explanation that the price support from relationship institutions can also discourage trading for short-term earnings shocks.

## 2.3 Hypotheses

Relationship institutions and independent institutions may have different incentives, information sets, and trading behaviors for the firms whose shares they own. We presume that all institutions have incentives to make optimal investment decisions. However, relationship institutions also have incentives to maintain good relations with their client firms, and may simultaneously enjoy an informational advantage over their non-connected rivals. The banking

fees paid by corporate clients and future possible business opportunities provide potentially strong incentives for banks to maintain long-term relationships with their clients.

Because of information asymmetry in markets, firms suffering from temporary negative earnings shocks may not be able to credibly convey favorable information to outsiders. Thus, relationship institutions may play a role in certifying their client firms in the event of such transitory shocks. One possible strategy is for relationship institutions to increase their equity holdings in client firms, signaling their positive views to the market. If relationship institutions are successful, stock price reactions to negative earnings surprises will be smaller and post-earnings announcement drift will be less pronounced than otherwise. We refer to this scenario as the relationship insurance hypothesis. Conversely, relationship institutions may choose to exploit the private information obtained from their affiliated banks to improve their investment performance. If this is true, relationship institutions should sell shares before bad news, possibly magnifying the price reaction to negative earnings surprises. We refer to this scenario as the information advantage hypothesis.

## 3. Data and Research Design

### 3.1. Data Sources

Our sample consists of all common stocks listed on NYSE, AMEX and NASDAQ with CRSP share codes 10 or 11 from 1990 to 2004. Closed-end funds, real estate investment trusts (REITs), American Depository Receipts (ADRs) and foreign companies are eliminated from the sample. Our key variable of interest is quarterly institutional holdings data, which are from the Thomson Financial CDA/Spectrum institutional (13f) holdings database. All institutional holdings greater than 10,000 shares or $200,000 are reported to the Securities and Exchange Commission (SEC) on form 13-f and CDA/Spectrum collects information from these filings.

Bond and equity underwriting information comes from the Thomson Financial SDC/Platinum new issues database. Because there are numerous mergers and acquisitions among relationship institutions during the sample period, these transactions are gathered from the Thomson Financial SDC/Platinum mergers and acquisitions database. We obtain loan deal and lender information from Thomson Financial Reuter's LPC Dealscan database. Quarterly earnings announcement information is from the I/B/E/S Summary database. Stock prices, returns, and shares outstanding are obtained from CRSP. Finally, firm characteristics are from Compustat.

To test our hypothesis, we divide all institutional investors into two types: relationship institutions and independent institutions. Following current terminology we will typically refer to diversified financial institutions as banks. If a bank has a lending or underwriting relationship with a client firm, any of the bank's affiliated institutions that hold shares of this client firm are defined as this firm's "relationship institutions". Other institutions owning the same firm's shares but whose affiliated groups do not have lending or underwriting relationships are defined as "independent institutions". We use a three year window prior to an earnings announcement to classify institutions. For example, if Smith Barney underwrote an SEO for IBM within the past three years, the asset management divisions of Citigroup are classified as IBM's relationship institutions since Smith Barney and Citigroup belong to the same conglomerate group. On the other hand, if J.P. Morgan holds shares of IBM without a lending or underwriting relationship, J.P. Morgan is classified as an independent institution for IBM. Similarly, we divide all firms in our study into two types: "connected firms" and "unconnected firms". Connected firms (e.g. IBM) are those firms paying banking fees to their relationship institutions within past three years. Unconnected firms are those without any relationship institutions. Note that this may be

either because the firm has not used the services of a bank within the past three years, or if so, none of the bank's asset management affiliates own shares in the firm.

To identify client equity held by relationship institutions we match (by hand) data on the lenders from LPC/Dealscan and underwriters from SDC/Platinum to institutional holdings in CDA/Spectrum. Over our sample period there are more than 10,000 institutional investors' names in CDA/Spectrum and about 10,000 lender and underwriter names. All names are corrected for changes in parent holding company names by incorporating M&A information. Due to the magnitude of the effort required to hand match banks by name, we focus only on those with brokerage services, which includes most financial conglomerates. Finally, the institutional holdings data are merged with the I/B/E/S, CRSP, and Compustat data by Cusip for each firm in our sample.

3.2 Empirical Test Design

We first explore the trading behavior of relationship and independent institutions in shares of connected firms. We also examine the trading behavior of independent institutions in shares of unconnected firms. Given our data limitations, we infer the extent of buying or selling each quarter surrounding earnings announcements by calculating changes in institutional holdings as reported in SEC form 13-f.

In the second set of tests, we use event study methods to examine whether abnormal returns around earnings announcements differ between connected and unconnected firms. Abnormal returns (CAR) for the announcement period (-1, +1) are computed with the market model using an estimation period of days -255 to -10 relative to each earnings announcement. Unreported findings using market-adjusted returns and/or CAR (0, +2) produce nearly identical results. Each quarter we estimate a Fama-Macbeth cross-sectional regression to study the relation

between announcement period CARs and various characteristics of the announcing firms. The dependent variable is cumulative abnormal returns (CAR -1, +1). The model can be expressed as:

$$CAR_i = \beta_0 + \beta_1 Dum\_rela_i + \beta_2 Re\_num_i + \beta_3 Size_i + \beta_4 (B/M)_i + \beta_5 SUE_i + \beta_6 Age_i + \beta_7 Err_i + \beta_8 Numest_i + \beta_9 Stdev_i + \beta_{10} Cum\_return_i + e_i \quad (1)$$

Independent variables include:

Dum_rela: equal to 1 if the firm is connected (has one or more relationship institutions) and 0 otherwise

Re_num: the number of relationship institution for each firm

Size: log of market value at the quarter prior to each earnings announcement

B/M: book value divided by market value the quarter prior to each earnings announcement

Age: the number of years since the firm was added to CRSP

Err: actual earnings per share minus the consensus of analysts' forecasts, deflated by the stock price at the end of each quarter prior to the earnings announcement

Numest: number of analysts following each firm the quarter before each announcement

Stdev: cross-sectional standard deviation of analysts' earnings forecasts the quarter before each announcement

Cum_return: three-month cumulative return before each announcement

SUE: current quarter's standardized unexpected earnings defined based on Chordia and Schivakumar (2006) as follows:

$$SUE = \frac{\text{Quarterly earnings - Expected quarterly earnings}}{\text{Standard deviation of earnings change in the prior eight quarters}} \quad (2)$$

Expected quarterly earnings are proxied by earnings four quarters previous to the current quarter. The final sample consists of 107,157 firm-quarter earnings announcements from 1990 to 2004.

We then examine whether earnings momentum differs between connected and unconnected firms. Prior literature has used a variety of methods to estimate expected quarterly earnings (Jones and Litzenberger, 1970; Latane and Jones, 1979; Bernard and Thomas, 1989; Chan, Jegadeesh and Lakonishok, 1996). However, Jegadeesh and Titman (2001) show that the accuracy of the earnings expectations model is not particularly important for the purpose of measuring unexpected earnings to predict momentum returns.

In our final set of tests, we construct a measure of price support (described in section 4.4) to capture the interaction between trading intensity and the sign and magnitude of the earnings surprise. We examine differences in price support for connected and unconnected firms across SUE quintiles. We also contrast cumulative abnormal returns associated with different levels of price support starting from the measure construction period and the subsequent two years.

3.3 Summary Statistics

Table 1 provides median descriptive statistics for the sample firms in this study. Each quarter we divide all firms with earnings announcements into two groups (connected vs. unconnected firms) depending upon whether a firm's stock is held by one or more relationship institutions prior to the announcement. Compared to unconnected firms, connected firms are larger, older and followed by more analysts. They also have higher median SUE and earnings per share, and smaller median book-to-market ratios. Regarding ownership variables, connected firms have higher ownership by institutions (61% vs. 45%) with about 1.1% owned by relationship institutions. Connected firms have a median of 3 (119) relationship (independent) institutional owners, while unconnected firms have a median of 53 independent owners. Because many of our tests focus on negative earnings surprises, we also present statistics based on the sign of SUE.

[Insert Table 1 here]

Table 2 presents the correlation matrix for the explanatory variables. Not surprisingly, correlations between Size and Dum_rela; Numest and Dum_rela, are high. Connected firms are larger and have more analyst coverage. Also, older firms tend to have more relationship institutions.

[Insert Table 2 here]

## 4. Empirical Results

### 4.1 Changes in Institutional Holdings

To examine the trading behavior of relationship institutions and independent institutions around earnings announcements, we partition all earnings announcements into quintiles each quarter based on SUE. Quintile 5 contains firms with the highest SUE and quintile 1 contains those with the lowest SUE. Results, reported in Table 3 reveal significant differences in trading between relationship and independent institutions. As a baseline for interpreting changes in holdings, the last row in Table 3 reports average holdings as of the end of quarter 0. The actual earnings announcement occurs sometime within the [-1, 0] quarter.

We acknowledge that our analysis is somewhat limited by the coarseness of the holdings data. Since we are interested in whether relationship firms support their clients in the event of bad news, we focus our analysis on SUE quintile 1. However, we note in passing that for neutral to positive SUE (quintiles 3 – 5) both relationship and independent institutions tend to increase their holdings of both connected and unconnected firms prior to earnings announcements. Also, for all quintiles there is a general buying trend after earnings announcements. The only exception is for quintile 5. Independent institutions, on average, appear to sell connected firms.

An interesting pattern emerges for negative SUE (quintile 1) firms. For connected firms, independent institutions significantly reduce their holdings prior to the announcement, possibly due to negative precursors of bad earnings reports. However, relationship institutions significantly increase their holdings prior to the announcement. Presuming that relationship institutions have information about their client firms that is at least as good as independent institutions, this behavior supports the relationship insurance hypothesis, and runs counter to the information advantage (predatory) hypothesis. The argument is further supported by the significant buying among independent institutions following negative earnings announcements. The reversal of trading behavior by independent institutions the negative earnings shocks are, on average, transitory. It is likely to reverse in the near future.

For unconnected firms, independent institutions significantly reduce their holdings prior to the announcements. Interestingly, independent institutions sell unconnected firms much more aggressively that connected firms. Over the cumulative [-3, 0] window leading up to the earnings announcement independent firms reduce their holdings of connected (unconnected) firms by 0.72% (1.76%) respectively. This is consistent with the notion that the observed behavior of relationship institutions serves as a deterrent that restrains the selling of connected firms by independent institutions prior to the announcement.

[Insert Table 3 here]

4.2 Abnormal Returns around Earnings Announcements

In this section, we use the Fama-Macbeth (1973) methodology to examine three-day cumulative abnormal returns around earnings announcements. Because market reactions differ, we estimate the model first for all announcements, and then separately for announcements with positive surprises and negative surprises based on the sign of the SUE. The dependent variable is

CAR (-1, +1) surrounding the announcement day, using the market model. Each quarter we estimate the cross-sectional regression model (equation 1), and then calculate the time-series mean and standard deviation of the coefficients over the sample period.

Table 4, Panel A presents results for all announcements. The primary result is that the coefficient on the dummy variable representing the presence of at least one relationship institution (Dum_rela) is positive and significant at the 1% level in all specifications. For example, in Model 3 connected firms have a 0.29% (t-value = 4.49) higher CAR than unconnected firms. As an alternate specification, in Model 4 the coefficient on Re_num shows that firms with one more relationship institution have on average a 0.08% higher CAR (t-value = 2.59). These findings are consistent with the relationship insurance hypothesis; connected firms experience better earnings announcement period abnormal returns.

Panel B shows results for positive earnings surprises. As in Panel A, the coefficient estimates on Dum_rela are positive and significant in all models. For example, in Model 3 connected firms have a 0.20% (t-value = 2.86) higher CAR than unconnected firms. Model 4 shows that for positive earnings surprises, firms with one more relationship institution have on average a 0.07% higher CAR (t-value = 2.54). A more optimistic response to positive earnings surprises when companies have relationship institutions could be the result of the certification effect. For example, Puri (1996) shows that investors are willing to pay relatively higher prices for securities underwritten by commercial banks than by investment banks due to the issuing firms having closer or longer term relationships with commercial banks.

Panel C provides results for negative earnings surprises. As before, the coefficient estimates on Dum_rela are positive and significant in all models. For example, in Model 3 connected firms have a 0.38% (t-value = 3.18) higher CAR than unconnected firms. Model 4

shows that for negative earnings surprises, firms with one more relationship institution have on average a 0.07% higher CAR (t-value = 1.97). These results indicate that connected firms have a significantly smaller (negative) price impact than unconnected firms when negative earnings surprises occur.

Comparing positive and negative surprises provides some insight regarding the relationship institution hypothesis. First, as is well known, the market is more sensitive to negative surprises. This is confirmed by comparing the coefficients on SUE in Model 3, Panels B and C (0.0010 vs. 0.0030). In our sample the market is three times more sensitive to negative versus positive surprises. Second, the impact of the presence of at least one relationship institution is greater for negative versus positive surprises. For example, the estimated coefficient of Dum_rela in Model 3 of Panel C is roughly double that of Panel B (0.0038 vs. 0.0020). These findings are consistent with the relationship insurance hypothesis if it is more important for relationship institutions to support their clients' stock prices when these clients experience negative earnings shocks. Finally, coefficients on the control variables are significant and broadly consistent with the literature on earnings announcements (see, for example, Berkman, Dimitrov, Jain, Koch, and Tice, 2009).

[Insert Table 4 here]

4.3 Earnings Momentum

In this section we use standard methodology to examine post-earnings announcement momentum (drift) for connected and unconnected firms. Each month, we categorize firms as connected or unconnected and then sort them into quintiles based on SUE from their most recent earnings announcement. Firms in Portfolio SUE1 have the lowest SUE (negative surprises) and

firms in portfolio SUE5 have the highest SUE (positive surprises). We then examine average monthly raw returns over one, three and six month holding periods.

Panel A of Table 5 shows that for unconnected firms the average return difference between SUE5 firms and SUE1 firms is a statistically significant 1.55 % (t-value=5.91) over a one month holding period. By contrast, the difference for connected firms is an insignificant 0.41%. Also, the difference in momentum between connected and unconnected firms is a statistically significant -1.14% (t-value = -5.37). Over the three and six month holding periods, average monthly momentum returns decrease for unconnected firms, but they remain statistically significant. For connected firms, the momentum effect actually becomes negative, though it remains insignificant. Importantly, for all horizons, momentum for unconnected firms is significantly greater than for connected firms. To interpret these results, we note that the momentum returns for unconnected firms are similar to those in the literature (Chan, Jegadeesh and Lakonishok, 1996; Jegadeesh and Titman, 1993). However, for connected firms, momentum returns have been smoothed. Returns for low (negative) SUE1 firms are higher, while returns to high (positive) SUE 5 firms are lower. This pattern is consistent with relationship institutions supporting client firms when needed (negative earnings surprises), but perhaps not when unneeded (positive earnings surprises).

[Insert Table 5 here]

4.4 Addressing Sample Selection Issues and Price Support Measures

The direct comparison of connected and unconnected firms thus far may suffer from a sample selection problem. It is possible that the observed differences in trading behavior, short run and long run returns surrounding earnings announcements may be driven by unobserved differences in firm characteristics between connected and unconnected firms, rather than by the

deliberate actions of relationship institutions. To address this concern, we re-examine the effects of institutional behavior by contrasting the degree of price support within the set of connected firms. The crux of our hypotheses center on institutions' behavior when there is bad news, thus we focus on negative earnings surprises in the following discussion.

Recall from Table 1, for the negative earnings surprise sample, connected firms have a median of 3 (101) relationship (independent) institutions holding their shares. To focus on the intensity of trading by individual institutions, we standardize each quarter's trading activity by constructing a price support (PS) measure similar to Shu's (2007) positive-feedback measure (MT measure). Specifically, we use the following procedures to calculate the PS measure. First, we calculate $\Delta hold_{i,t}$ (changes in holdings) for firm i in quarter t and divide it by $\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|$, the sum of the absolute value of changes in institutional holdings of firm i over the four quarters leading up to the announcement (quarter t). Second, we calculate an SUEindexi,t, a discrete index to measure the sign and magnitude of SUE for firm i in quarter t. To do this, each quarter firms are sorted into quartiles by SUE and assigned an SUEindexi,t with values: -2, -1, 1 or 2. Finally, each quarter, we multiply $\frac{\Delta hold_{it}}{\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|}$ by SUEindexi,t and sum the product across the past four quarters to obtain the price support measure (PS). Note that when SUEindexi,t is positive, a higher PS measure indicates greater buying. However, when SUEindexi,t is negative, a smaller (more negative) PS indicates greater buying, i.e., a contrarian strategy.

Panel A of Table 6 reports PS measures for connected firms, sorted into quintiles by their past four quarter's average SUE. For the most positive earnings surprises (quintile 5) connected firms have positive price support by both relationship and independent institutions. However,

price support by relationship institutions is significantly higher than for independent institutions (difference in PS = 0.29, t-value = 4.59). For the most negative earnings surprises (quintile 1) connected firms also have positive price support by both relationship and independent institutions (a negative SUEindex multiplied by a positive scaled change in holdings). Again, PS is significantly higher for relationship institutions, supporting the relationship institution hypothesis (difference in PS = -0.10, t-value = -2.21). For completeness, Panel B examines the behavior of independent institutions with respect to their PS measures for connected and unconnected firms. PS by independent institutions is positive for both connected and unconnected firms when earnings surprises are most positive (quintile 5). However, for the most negative earnings surprises (quintile 1), PS by independent institutions is negative for connected firms and positive for unconnected firms (difference in PS = -0.14, t-value = -3.41, remembering the SUEindex is negative in this case). These findings suggests that independent institutions pursue momentum strategy for unconnected firms regardless of the sign of earnings surprises, but pursue such a strategy for connected firms only when the earnings surprises are positive. Like our results using raw changes in holdings reported in Table 3, our scaled price support measure also shows significant differences in institutional trading, in support of the relationship institution hypothesis. The price support also appears to induce independent institutions to reduce their likelihood to pursue momentum strategy.

[Insert Table 6 here]

4.5 Abnormal Hedge (Buy-minus-sell) Returns

As a final test of the potential differential effects of trading by relationship versus independent institutions, we examine abnormal hedge (buy-minus-sell) returns conditional on the sign of average SUE during the four PS measure construction quarters (the PS period). We also

follow the returns of hedged portfolios for two years following the PS period. We are not suggesting that institutions are holding these hedge portfolios for two years. It is used to investigate the impacts on firms following the trading activities. Specifically, we estimate monthly CARs using the Fama-French-Carhart four-factor model. Each quarter we sort connected firms (also unconnected firms separately) that have had a negative average SUE over the previous four quarters into quintiles based on their PS measures. The hedged portfolio holds (shorts) the one with the most buy (sell) PS quintile, i.e., buy minus sell. We follow the similar procedure for firms with a positive average SUE.

Table 7 shows striking hedge return patterns. It is obvious that independent institutions are trading for temporary price movements. The concurrent hedge returns are significantly positive and only during the PS period regardless of portfolios experiencing negative or positive average SUEs. More strikingly, for the portfolio with a negative average SUE, the hedge returns are significantly negative lasting for 15 months for connected firms and 9 months for unconnected firms following the PS period.

Figure 1 traces the price levels of connected firms experiencing a negative average SUE using the original buy and sell portfolio abnormal returns. We assume all portfolios start with a hypothetical index price of 100. If a portfolio always has 0 abnormal returns during the following three years, its price will remain at 100. Figure 1 shows that the significantly negative hedge returns sorted on the PS measures of independent institutions are driven by the dramatic price reversals of the extreme sell portfolio. The price level of this portfolio drops more than 13 points to below 87 during the third PS constructing quarter. It takes about two years for this portfolio to resume its price level at 100. On the other hand, the price path of extreme buy portfolio by independent institutions is rather flat following the PS period. The results suggest that, when

firms experience negative SUEs, the selling pressure by independent institutions pushes the stock prices from firms' fundamental values for rather extensive periods. If the selling is information driven, we should not have observed the price reversals and the hedge returns should have been insignificantly different from 0 following the PS period.

In contrast, Table 7 reports that the hedge returns sort on PS measure by relationship institutions are indeed insignificantly different from 0 during the PS period except for the last quarter, which is significantly negative. The negative hedge returns continue for the following two years. The findings suggest that relationship institutions do not use their private information to trade for profit instead they trade to support their clients.

Consistent with the above claim, Figure 1 shows that the price levels of both buy and sell portfolios by relationship institutions follow similar paths during the first three PS construction quarters, but the sell group rebounds during the last PS quarter and continue to rise for the following two years. During the same period, the price levels of buy group hover slightly below the 100 mark. These price paths are consistent with the explanation that, with limited capital to support client firms' stock prices, banks choose to sell the clients rebounding on their own and buy those in need of price supports. In this sense, banks are using private information to decide which firms to support rather than trading for profit. If the trading of relationship institutions have no purposes or effects, one should have expected similar price paths of both buy and sell portfolios during the PS period and no price reversals following the PS period.

Another observation implied by Figure 1 is that relationship and independent institutions do not buy and sell the same group of firms. If both types of institutional investors trade in the same way, i.e., buy and sell the same group of firms, the price paths of buy (or sell) for both types of institutions would have been similar. The fact that the group of firms supported by

relationship institutions exhibits smooth price path in contrast to that sold by independent institutions is consistent with the relationship insurance hypothesis. The impact of such supports seems quite remarkable when one considers relationship institutions are outnumbered by about 100:1 for a typical client firm (Table 1 also shows the percent of client firms' shares held by relationship institutions is also dwarfed by the holdings of independent institutions). Second, if one considers abnormal returns (long-term drift) surrounding earnings announcements to represent an anomaly or market inefficiency, then PS by relationship institutions helps to reduce this drift.

[Insert Table 7 here]

**5. Conclusion**

Financial conglomerates have the opportunity to gather information from multiple sources, and to use that information in multiple ways. When asset managers hold shares of firms that also have lending or underwriting relationships with affiliated banks, they may either exploit private information obtained from their affiliated banks to make profits (information advantage hypothesis), or support their clients to maintain good relationships in hope of future business opportunities (relationship insurance hypothesis). Although "Chinese Walls" are designed to prevent information spillover among different divisions of financial conglomerates, prior studies suggest that Chinese Walls may not be totally effective. This paper examines the trading behavior of relationship institutions and the resulting impact on connected client firms, focusing primarily upon when these client firms experience negative earnings shocks.

Our empirical findings support the relationship insurance hypothesis since relationship institutions support their client firms when these firms have negative earnings surprises. This support (increase in share holdings) also appears to discourage selling pressure from independent

institutions holding shares in these client firms. Moreover, price support from relationship institutions mitigates both the negative announcement period returns and the post-earnings-announcement-drift of client firms, thus generates smoother price paths of client firms.

We believe this paper contributes to the literature on the roles of institutional investors and, more generally, financial institutions by studying the non-intermediary role of financial conglomerates in the capital markets. The findings also provide implications for the asset pricing literature. If relationship institutions can reduce unnecessary temporary price movements, less noise in financial markets could be considered welfare enhancing.

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Table 1 Summary Statistics

This table reports median statistics for the sample of 107,157 firm-quarters with earnings announcements from March 1990 to December 2004. Each quarter, sample firms are defined as connected or unconnected based on whether their shares are held by their relationship institutions. Relationship institutions are those whose affiliated banks have had either a lending or underwriting relationship with client firms over the previous three years. All announcements are divided into positive and negative earnings surprises depending on the sign of SUE defined as:

$$SUE = \frac{\text{Quarterly earnings - Expected quarterly earnings}}{\text{Standard deviation of earnings change in the prior eight quarters}}$$

where expected quarterly earnings are earnings four quarters ago. *Size* is market capitalization (in millions). *B/M* is book value divided by market value. *Age* is the number of years since the firm first appeared in CRSP. *Err (in %)* is actual earnings per share minus the consensus analyst forecast, deflated by stock price at the end of the quarter prior to the earnings announcement. *Numest* is the number of analysts following a firm the quarter before each announcement. *Stdev* is the cross-sectional standard deviation of analysts' earnings forecasts. *Cum_return* is the three-month cumulative return prior to each earnings announcement. *Pct* is the aggregate percentage of each firm's shares held by all institutions. *Rela_pct* and *Ind_pct* are corresponding measures for relationship and independent institutions respectively. *Avepct* is the average percentage of each firm's shares held per institution. *Averelapct* and *Aveindpct* are corresponding measures for relationship and independent institutions respectively. *Re_num* is the number of relationship institutions for each client firm. *Ind_num* is the corresponding number of independent institutions. For brevity, we don't report significance levels, but for most variables, differences between connected and unconnected firms are significant at the 1% level.

Table 1 (Continued)

| | All announcements | | | Positive earnings surprise | | | Negative earnings surprise | | |
|---|---|---|---|---|---|---|---|---|---|
| | Connected | Unconnected | Difference | Connected | Unconnected | Difference | Connected | Unconnected | Difference |
| SUE | 0.463 | 0.412 | 0.051 | 1.118 | 1.025 | 0.093 | -0.933 | -0.886 | -0.047 |
| Size | 1144.267 | 301.795 | 842.473 | 1371.510 | 371.426 | 1000.084 | 796.626 | 201.445 | 595.181 |
| B/M | 0.472 | 0.530 | -0.058 | 0.416 | 0.479 | -0.063 | 0.592 | 0.658 | -0.066 |
| Age | 16 | 13 | 3 | 16 | 13 | 3 | 15 | 12 | 3 |
| Err | 0.013 | 0.000 | 0.013 | 0.032 | 0.026 | 0.006 | -0.043 | -0.146 | 0.103 |
| Numest | 7 | 3 | 4 | 7 | 4 | 3 | 6 | 3 | 3 |
| Stdev | 0.010 | 0.010 | 0.000 | 0.010 | 0.010 | 0.000 | 0.020 | 0.020 | 0.000 |
| Cum_return | 5.48% | 5.76% | -0.28% | 8.48% | 10.21% | -1.73% | -0.91% | -3.45% | 2.54% |
| Pct | 61.37% | 44.90% | 16.46% | 62.90% | 46.60% | 16.30% | 58.35% | 41.68% | 16.67% |
| Rela_pct | 1.10% | 0.00% | 1.10% | 1.14% | 0.00% | 1.14% | 1.03% | 0.00% | 1.03% |
| Ind_pct | 58.89% | 44.90% | 13.98% | 60.38% | 46.59% | 13.79% | 55.73% | 41.68% | 14.05% |
| Avepct | 0.48% | 0.80% | -0.31% | 0.46% | 0.75% | -0.30% | 0.53% | 0.88% | -0.35% |
| Averelacpt | 0.32% | 0.00% | 0.32% | 0.33% | 0.00% | 0.33% | 0.30% | 0.00% | 0.30% |
| Aveindpct | 0.48% | 0.80% | -0.31% | 0.46% | 0.75% | -0.30% | 0.53% | 0.88% | -0.35% |
| Re_num | 3 | 0 | 3 | 3 | 0 | 3 | 3 | 0 | 3 |
| Ind_num | 119 | 53 | 66 | 129 | 58 | 71 | 101 | 44 | 57 |
| # of obs. | 57729 | 49428 | | 38017 | 32788 | | 19712 | 16640 | |

Table 2 Correlation Matrix for Explanatory Variables

This table presents the correlation matrix for explanatory variables in the regression analysis. All variables are defined in Table 1.

| | Dum_rela | Re_num | Size | B/M | SUE | Age | Err | Numest | Stdev | Cum_return |
|---|---|---|---|---|---|---|---|---|---|---|
| Dum_rela | 1.00 | | | | | | | | | |
| Re_num | 0.56 | 1.00 | | | | | | | | |
| Size | 0.38 | 0.52 | 1.00 | | | | | | | |
| B/M | -0.06 | -0.06 | -0.36 | 1.00 | | | | | | |
| SUE | 0.02 | 0.03 | 0.26 | -0.25 | 1.00 | | | | | |
| Age | 0.09 | 0.22 | 0.45 | -0.03 | 0.02 | 1.00 | | | | |
| Err | 0.01 | 0.01 | 0.03 | -0.08 | 0.04 | 0.01 | 1.00 | | | |
| Numest | 0.30 | 0.42 | 0.72 | -0.21 | 0.18 | 0.21 | 0.02 | 1.00 | | |
| Stdev | 0.01 | 0.02 | -0.05 | 0.12 | -0.10 | 0.00 | -0.04 | -0.03 | | |
| Cum_return | -0.02 | -0.03 | 0.02 | -0.10 | 0.13 | -0.03 | 0.02 | -0.02 | -0.04 | 1.00 |

Table 3 Institutional Trading and Earnings Surprises

This table reports mean values of institutional holdings in percentage and quarterly changes in holdings surrounding earnings announcements. Earnings are announced in quarter [-1, 0]. All firms are divided into connected and unconnected firms based on whether their shares are held by relationship institutions whose affiliated banks have had lending or underwriting relationships with these firms within three years prior to the most recent earnings announcement. Institutions holding the shares of connected firms are classified as either relationship institutions (REL) or independent institutions (IND). Finally, all firms are further sorted into quintiles according to their most recent SUE announced during quarter [-1.0]. Panel A reports the highest and lowest quintiles, which Panel B reports the remaining middle three quintiles. The last row shows the level of holdings at the end of the quarter when earnings are announced; other rows are changes in holdings. Corresponding windows are denoted in brackets. Earnings surprise (SUE) is defined in Table 1. The symbols: *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

| | SUE 1 (Lowest) | | | | | | SUE 5 (Highest) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Connected | | | | Unconnected | | Connected | | | | Unconnected | |
| QTR | REL | | IND | | IND | | REL | | IND | | IND | |
| Panel A: SUE quintiles 1 and 5 | | | | | | | | | | | | |
| [-3, -2] | 0.039 | ** | -0.349 | *** | -0.436 | *** | 0.133 | *** | 0.563 | *** | 0.590 | *** |
| [-2, -1] | 0.046 | *** | -0.192 | ** | -0.629 | *** | 0.138 | *** | 0.683 | *** | 0.553 | *** |
| [-1, 0] | 0.028 | ** | -0.177 | ** | -0.693 | *** | 0.153 | *** | 0.500 | *** | 0.428 | *** |
| [0, 1] | 0.046 | *** | 0.205 | *** | -0.733 | *** | 0.155 | *** | 0.568 | *** | -0.247 | ** |
| [1, 2] | 0.001 | | 0.174 | ** | 0.541 | *** | 0.046 | *** | -0.490 | *** | 0.739 | *** |
| [2, 3] | 0.013 | | 0.443 | *** | 0.430 | *** | 0.050 | *** | -0.149 | | 0.225 | ** |
| [3, 4] | 0.025 | | 0.447 | *** | 0.473 | *** | 0.052 | *** | -0.145 | | 0.185 | * |
| [4, 5] | 0.024 | | 0.487 | *** | 0.489 | *** | 0.040 | ** | -0.216 | ** | 0.195 | ** |
| Current quarter | 2.22 | | 53.67 | | 41.74 | | 2.41 | | 61.10 | | 48.68 | |

Table 3 (Continued)

| | SUE 2 | | | | | SUE 3 | | | | | SUE 4 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Connected | | | | Unconnected | Connected | | | | Unconnected | Connected | | | | Unconnected |
| QTR | REL | | IND | | IND | REL | | IND | | IND | REL | | IND | | IND |
| Panel B: SUE Quintiles 2 to 4 | | | | | | | | | | | | | | | |
| [-3, -2] | 0.060 | *** | 0.099 | | -0.040 | 0.075 | *** | 0.483 | *** | 0.520 | *** | 0.087 | *** | 0.775 | *** | 0.565 | *** |
| [-2, -1] | 0.086 | *** | 0.183 | ** | -0.034 | 0.090 | *** | 0.751 | *** | 0.528 | *** | 0.115 | *** | 0.859 | *** | 0.742 | *** |
| [-1, 0] | 0.092 | *** | 0.406 | *** | -0.116 | 0.080 | *** | 0.690 | *** | 0.453 | *** | 0.125 | *** | 0.966 | *** | 0.626 | *** |
| [0, 1] | 0.102 | *** | 0.642 | *** | -0.224 ** | 0.112 | *** | 0.846 | *** | 0.186 | * | 0.116 | *** | 1.168 | *** | 0.102 | |
| [1, 2] | 0.023 | | 0.096 | | 0.507 *** | -0.002 | | 0.102 | | 0.785 | *** | 0.020 | | -0.011 | | 0.898 | *** |
| [2, 3] | 0.025 | | 0.385 | *** | 0.513 *** | 0.042 | *** | 0.299 | *** | 0.356 | *** | 0.040 | *** | 0.191 | ** | 0.405 | *** |
| [3, 4] | 0.013 | | 0.652 | *** | 0.457 *** | 0.068 | *** | 0.373 | *** | 0.317 | *** | 0.041 | *** | 0.072 | | 0.151 | |
| [4, 5] | 0.027 | | 0.391 | *** | 0.318 *** | 0.036 | ** | 0.405 | *** | 0.336 | *** | 0.056 | *** | 0.241 | ** | 0.278 | ** |
| Current quarter | 2.13 | | 53.48 | | 41.87 | 2.18 | | 55.87 | | 44.19 | | 2.23 | | 57.44 | | 45.23 | |

Table 4 Regressions of Stock Market Reactions Surrounding Earnings Announcements

This table presents the results of Fama-Macbeth regressions. The dependent variable is the 3-day cumulative abnormal returns, CAR (-1, +1), estimated by the market model surrounding earnings announcements. Panels A, B, and C report the results estimated with all earnings announcements, positive earnings surprises, and negative earnings surprises, respectively. Independent variables are defined in Table 1. Numbers in parentheses are *t*-values. Regression intercepts are suppressed for brevity. The symbols: *, ** and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| Model | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Panel A: All announcements | | | | |
| Dum_rela | 0.00208*** | 0.00251*** | 0.00289*** | |
| | (3.45) | (4.00) | (4.49) | |
| Re_num | | | | 0.000784** |
| | | | | (2.59) |
| Size | -0.00148*** | -0.00164*** | -0.00206*** | -0.00226*** |
| | (-5.42) | (-3.61) | (-4.23) | (-4.47) |
| B/M | 0.00819*** | 0.00770*** | 0.0105*** | 0.0104*** |
| | (7.03) | (5.90) | (8.00) | (7.72) |
| SUE | 0.00384*** | 0.00325*** | 0.00174*** | 0.00174*** |
| | (21.19) | (16.46) | (7.94) | (7.66) |
| Age | 0.00129*** | 0.00129** | 0.00128*** | 0.00111** |
| | (3.03) | (2.52) | (2.81) | (2.31) |
| Err | | | 0.0945*** | 0.0958*** |
| | | | (3.53) | (3.66) |
| Numest | | 0.000180* | 0.000380*** | 0.000377*** |
| | | (1.98) | (3.96) | (3.80) |
| Stdev | | -0.00974*** | 0.00561 | 0.00564 |
| | | (-2.80) | (1.21) | (1.22) |
| Cum_return | | | 0.0546*** | 0.0546*** |
| | | | (24.90) | (24.97) |
| $R^2$ | 0.02 | 0.02 | 0.08 | 0.08 |
| N | 103887 | 90594 | 90589 | 90589 |

Table 4 (Continued)

| Model | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Panel B: Positive earnings surprises | | | | |
| Dum_rela | 0.00124* | 0.00163** | 0.00201*** | |
| | (1.72) | (2.30) | (2.86) | |
| Re_num | | | | 0.000669** |
| | | | | (2.54) |
| Size | -0.00245*** | -0.00289*** | -0.00247*** | -0.00266*** |
| | (-6.78) | (-6.10) | (-4.81) | (-4.88) |
| B/M | 0.0126*** | 0.0130*** | 0.0156*** | 0.0155*** |
| | (9.38) | (8.22) | (10.80) | (10.63) |
| SUE | 0.00176*** | 0.00151*** | 0.000960*** | 0.000950*** |
| | (7.61) | (6.96) | (4.18) | (3.90) |
| Age | 0.000773 | 0.000829 | 0.00106* | 0.000911 |
| | (1.28) | (1.29) | (1.81) | (1.49) |
| Err | | | 0.486*** | 0.486*** |
| | | | (5.30) | (5.31) |
| Numest | | 0.000316*** | 0.000425*** | 0.000412*** |
| | | (3.45) | (4.30) | (3.92) |
| Stdev | | -0.0125* | -0.0216* | -0.0218* |
| | | (-1.76) | (-1.89) | (-1.91) |
| Cum_return | | | 0.0506*** | 0.0506*** |
| | | | (19.30) | (19.46) |
| $R^2$ | 0.02 | 0.02 | 0.09 | 0.09 |
| N | 68792 | 60881 | 60879 | 60879 |

Table 4 (Continued)

| Model | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Panel C: Negative earnings surprises | | | | |
| Dum_rela | 0.00325** | 0.00372*** | 0.00377*** | |
| | (2.48) | (2.95) | (3.18) | |
| Re_num | | | | 0.000693* |
| | | | | (1.97) |
| Size | 0.00211*** | 0.00118** | -0.000751 | -0.000777 |
| | (6.30) | (2.49) | (-1.33) | (-1.31) |
| B/M | 0.00892*** | 0.00770*** | 0.00924*** | 0.00919*** |
| | (4.92) | (3.46) | (4.62) | (4.58) |
| SUE | 0.00657*** | 0.00650*** | 0.00295*** | 0.00295*** |
| | (10.30) | (9.07) | (3.87) | (3.89) |
| Age | 0.000356 | 0.000713 | 0.000511 | 0.000299 |
| | (0.86) | (1.28) | (0.92) | (0.53) |
| Err | | | 0.0652* | 0.0653* |
| | | | (1.87) | (1.87) |
| Numest | | 0.000284** | 0.000510*** | 0.000518*** |
| | | (2.12) | (3.80) | (3.87) |
| Stdev | | -0.000747 | 0.0123 | 0.0125* |
| | | (-0.10) | (1.64) | (1.69) |
| Cum_return | | | 0.0573*** | 0.0571*** |
| | | | (20.71) | (20.76) |
| $R^2$ | 0.02 | 0.03 | 0.08 | 0.08 |
| N | 35095 | 29713 | 29710 | 29710 |

Table 5 Earnings Momentum

This table reports average monthly returns for earnings momentum portfolios for holding periods of one, three and six months following earnings announcements. Sample firms are divided into connected and unconnected firms each month, based on whether they are held by their relationship institutions. Then, all firms are sorted independently into quintiles based on their most recent SUE. Portfolio SUE1 contains firms with the lowest SUE and SUE5 contains the highest SUE firms. Time-series average monthly returns are then calculated for each holding period portfolio. SUE5-SUE1 measures post-announcement earnings momentum. DIFF is the difference in earnings momentum between connected and unconnected firms. The numbers in parenthesis are *t*-values. The symbols: *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

| | SUE1 | SUE2 | SUE3 | SUE4 | SUE5 | 5 minus 1 | DIFF |
|---|---|---|---|---|---|---|---|
| Panel A: one month | | | | | | | |
| Connected | 1.18% | 1.11% | 1.57% | 1.79% | 1.59% | 0.41% | -1.14% |
| | (2.46)*** | (2.81)*** | (4.03)*** | (4.66)*** | (4.28)*** | (1.39) | (-5.37)*** |
| Unconnected | 0.72% | 1.34% | 1.83% | 2.17% | 2.27% | 1.55% | |
| | (1.62) | (3.05)*** | (4.72)*** | (5.83)*** | (6.71)*** | (5.91)*** | |
| Panel B: three months | | | | | | | |
| Connected | 1.63% | 1.20% | 1.54% | 1.66% | 1.43% | -0.19% | -1.13% |
| | (3.19)*** | (2.99)*** | (4.00)*** | (4.15)*** | (3.87)*** | (-0.61) | (-4.46)*** |
| Unconnected | 1.04% | 1.47% | 1.83% | 1.96% | 1.97% | 0.93% | |
| | (2.31)** | (3.44)*** | (4.79)*** | (5.31)*** | (5.89)*** | (3.49)*** | |
| Panel C: six months | | | | | | | |
| Connected | 1.76% | 1.32% | 1.54% | 1.55% | 1.34% | -0.42% | -1.00% |
| | (3.42)*** | (3.34)*** | (4.00)*** | (3.78)*** | (3.62)*** | (-1.28) | (-3.79)*** |
| Unconnected | 1.20% | 1.56% | 1.83% | 1.81% | 1.79% | 0.59% | |
| | (2.67)*** | (3.70)*** | (4.72)*** | (4.98)*** | (5.28)*** | (2.15)** | |

Table 6 Price Support Measure

This table reports average price support (PS) measures for relationship and independent institutions. The PS measure is calculated over the four quarters ending in the quarter of the current earnings announcement, using the following procedures. First, we calculate changes in institutional holdings ($\Delta hold_{i,t}$) for firm *i* quarter *t* and divide it by $\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|$, the sum of the absolute value of changes in institutional holdings over the past four quarters. Second, we calculate the $SUEindex_{i,t}$, a discrete index to measure the sign and magnitude of SUE for firm *i* in quarter *t*. Then, each firm *i* is sorted into quartiles based on its quarter *t* SUE and assigned an $SUEindex_{i,t}$ with values of -2, -1, 1 or 2. For firm *i* in quarter *t*, we multiply $\frac{\Delta hold_{it}}{\sum_{j=0}^{3}\left|\Delta hold_{i,t-j}\right|}$ by $SUEindex_{i,t}$ and sum the product across the most recent four quarters to obtain (PS). A more positive (more negative) PS measure when SUE is positive (negative) indicates more buying by institutions. *Rel_PS* and *Ind_PS* are price support measures for relationship and independent institutions, respectively. Panel A compares price support measures between relationship institutions and independent institutions for connected firms by average 4 quarters' SUE quintile, i.e., each quarter, companies are sorted into quintiles based on their past four quarters' average SUE. Panel B compares price support measures of independent institutions between connected and unconnected firms. The symbols: *, ** and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| Quintile of Average 4 quarters' SUE | | 1 (Low) | 2 | 3 | 4 | 5 (High) |
|---|---|---|---|---|---|---|
| Panel A: Connected firms only | | | | | | |
| Connected firms | Rel_PS | -0.193 | -0.101 | -0.002 | 0.224 | 0.450 |
| Connected firms | Ind_PS | -0.091 | -0.069 | 0.024 | 0.161 | 0.162 |
| | Difference | -0.102** | -0.032 | -0.026 | 0.064** | 0.288*** |
| | *t*-value | (-2.21) | (-1.08) | (-1.37) | (2.00) | (4.59) |
| Panel B: Connected and unconnected firms | | | | | | |
| Connected firms | Ind_PS | -0.091 | -0.069 | 0.024 | 0.161 | 0.162 |
| Unconnected firms | Ind_PS | 0.049 | -0.036 | 0.067 | 0.192 | 0.262 |
| | Difference | -0.139*** | -0.033 | -0.043** | -0.031 | -0.100* |
| | *t*-value | (-3.41) | (-1.33) | (-2.14) | (-1.11) | (-1.94) |

Table 7 Long-term Hedge Returns Sorted on PS Measures

This table reports the buy-minus-sell hedge returns based on PS measures. The cumulative abnormal returns in percentage are estimated from the Fama and French 3-factor model with momentum factor. Negative (Positive) denotes subsample only includes firms whose previous average 4 quarter's SUEs are negative (positive). Connected (unconnected) firms are those with (without) relationship institutions. Firms are sorted into quintile based on the price support measure from either relationship institutions (Rel_PS) or from independent institutions (Ind_PS). The hedged portfolio holds the firms with extreme buy (quintile 5) but shorts the firms with extreme sell (quintile 1). PS measures are constructed during month -12 to month -1, while month 0 denotes the month when subsequent earnings reports are announced. The corresponding windows for abnormal returns are in the brackets.

| Avg. SUE | Negative during PS measure period | | | Positive during PS measure period | | |
|---|---|---|---|---|---|---|
| Firm type | Connected | | Unconnected | Connected | | Unconnected |
| Sort on | Rel_PS | Ind_PS | Ind_PS | Rel_PS | Ind_PS | Ind_PS |
| **PS measure construction period:** | | | | | | |
| [-12, -10] | 0.65 | 5.22*** | 5.64*** | 0.43 | 3.01*** | 2.04*** |
| [-9, -7] | 0.67 | 4.82*** | 5.14*** | 0.01 | 2.61*** | 2.32*** |
| [-6, -4] | -0.49 | 5.05*** | 2.91*** | -1.00** | 2.63*** | 1.94*** |
| [-3, -1] | -1.31* | 1.58** | -0.24 | -1.47*** | 1.06*** | 1.19** |
| **Two-year window following subsequent earnings announcements:** | | | | | | |
| [0, 0] | -0.35 | -1.46*** | -1.32** | -0.21 | -0.55** | -0.01 |
| [+1, +3] | -1.07 | -1.37* | -2.40*** | -1.68*** | -1.01** | -0.54 |
| [+4, +6] | -1.91*** | -1.69** | -2.51*** | -1.48*** | -0.41 | 0.06 |
| [+7, +9] | -1.49* | -1.71** | -2.44*** | -2.10*** | 0.04 | 0.46 |
| [+10, +12] | -2.84*** | -1.43* | -0.38 | -1.41*** | -0.47 | -0.14 |
| [+13, +15] | -0.42 | -2.03** | -1.17 | -1.63*** | 0.20 | 0.04 |
| [+16, +18] | -1.86*** | -0.73 | -0.88 | -2.32*** | 0.10 | 0.68 |
| [+19, +21] | -2.17*** | -1.17 | -0.41 | -1.59*** | -0.66 | 0.24 |
| [+22, +24] | -1.24* | -0.29 | -1.01 | -1.29*** | -0.44 | -0.38 |

The symbols: *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Figure 1 Indexed price levels of selected portfolios with negative average earnings surprises

This graph shows the level of indexed price based on the cumulative abnormal returns (CARs) estimated from the Fama and French 3-factor model with momentum factor. The CARs correspond to the underlying returns used to calculate hedge returns in Table 7. For example, the returns used to generate the indexed prices from [-12] to [-10] in Figure 1 for Rel(Buy) and Rel(Sell) correspond to the buy and sell portfolio returns used to generate hedge returns, i.e., the CARs of Rel(Buy) minus the CARs of Rel(Sell), during [-12, -10] in Table 7. The sample in Figure 1 only includes connected firms with negative average previous 4 quarters' SUEs. Connected firms are those with relationship institutions. Firms are sorted into quintile based on the price support measure from either relationship institutions (Rel) or from independent institutions (Ind). The hedge portfolio holds the firms with extreme buy (quintile 5) but shorts the firms with extreme sell (quintile 1). PS measures are constructed during month -12 to month -1, while month 0 denotes the month when subsequent earnings reports are announced. Earnings surprise (SUE) is defined in Table 1.